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In his discussion of the energies of men, William James has pointed out some possibilities in this direction which both cheer and stimulate. To advance this way sometimes calls for the preliminary removal of worn-out mental furniture. Few of us have escaped some forms of undesirable instruction—we have been given details in place of principles, aid instead of exercise, views as substitutes for demonstrations—and thus in respect to some sorts of knowledge it is as important to know how to let it go as in other cases to know how to grasp the parts worth while. Thus the aim of the progressive man must be to see life steadily and see it whole—prepared to change when change is growth, unwitting of fatigue, and never a worshiper at the shrine of his own past efforts, no matter how strenuous these may have been. Much more might be said upon this topic of the new demands and the adjustment for which they call, but if enough has been given to make you see that a serious problem lies that way my purpose is accomplished.

The moment has now come, as it does to every speaker, to wonder whether success has followed his attempt to reveal what he had in mind. What I have wanted to show you was this: The attitude towards knowledge during our student days is almost necessarily such as to throw the idea of change into the background and unduly to emphasize the permanency of the things then taught. The facts are otherwise.

Change has always been—will always be—and in the near future progress will be more rapid even than to-day. It is to this main fact that I urge you to adjust, for which I encourage you to prepare. The progress with which you have to blend your lives comes from work at the bedside, in the hospitals and in the laboratories and is also a by-product from advances in fields often seemingly remote from medicine.

Moreover, social advances, the growth in

the attitude of the community at large—which slowly alters like the form of a great cloud—presents an ever-changing background for the activities of the physician. Two important consequences of this touch you as medical men.

To succeed in truth, you must be prepared continually to replace old knowledge by new and to alter old economic methods and customs to meet the disappearance of some familiar forms of disease and their replacement in your life by newer medical problems and demands often of a general and a public nature.

To the generation of physicians to which you belong this task is allotted and it calls for the best you have to give. Surely the devotion to human welfare can not be less strong with you than with your noble predecessors and no hampering self-interest should be allowed to obscure from you the larger purposes of science and the sacred responsibilities of your profession.

Finally, it is through you that the layman learns of medical progress and its meaning, it is to you that he brings his questions and his doubts concerning methods of experiment and modes of inquiry needful for the advancement of your science, and both your appreciation and support of research in medicine are necessary to keep the public so informed that its representatives and lawgivers shall understand the purposes of this work and grant to it intelligent support.

HENRY H. DONALDSON

*THE AMERICAN ASSOCIATION FOR THE  
ADVANCEMENT OF SCIENCE  
A NATIONAL UNIVERSITY BASED ON  
NATIONAL IDEALS<sup>1</sup>*

BEFORE such a learned organization it is not necessary to dwell on the development of the modern university from its ancestral

<sup>1</sup> Address before the Section of Education at the Cleveland meeting of the American Association for the Advancement of Science.

prototype established by Abelard in Paris. By its very nature a university is the most conservative of organizations and its dominance over the thought of a people and all minor forms of education has been always acknowledged. The challenge to this right has always arisen outside its walls and influence, and such challenge has taken the form of many kinds of technical institutions to meet specific needs of the community forming their organization.

Neither is it necessary for me to point out to this audience how the idea of a specially favored educated class has always prevailed, and probably must always continue to a great extent. It was not, however, till our people grew up to independence on the basis that all men are created equal that the free public school became the corner-stone of our national life. Our material success as a nation is largely attributed to the splendid system of common schools and we congratulate ourselves that they are the best in the world. This national pride is flattered by the supposed acknowledgment of their superiority as evidenced by the visiting boards of inspection that come here occasionally from foreign countries. There seems, however, to be no fear that self-complacency will lull us into inaction, for we are a progressive people, and are well aware that institutions which are too tightly bound by fixed methods inevitably begin to die. Everywhere we are alive to our shortcomings, and great as our educational system is, nevertheless we are ever aware that somewhere, somehow, things are not altogether right.

It is safe to say that education is both an economic and a social question. Let us now consider them both. So long as the laws limit citizenship to those who have attained twenty-one years of age, is it wise economy to allow the youth of our land to

leave school at the age of fourteen or fifteen? Physically, mentally, morally and spiritually they are only partly developed, and yet our boasted system of education loses its hold on 80 to 90 per cent. or from eight to ten millions of our youthful population. The recent exhibition in Washington of the International Congress of Hygiene and Demography showed one phase of the result of such neglect of our youth, and as we have printed a bulletin on its relations to the university, copies of which are here for distribution, I will not now dwell on these arguments, but simply state that the sum total of the scientific research into vital statistics goes to show that crime and disease and degeneration are increasing more rapidly than the increase of the population; that genetically we are not breeding most from the best types of humanity but from the weaker ones. I ventured to point out that, as the school system fails to hold the children between the ages of fourteen and twenty-one, we are losing the most potent years for the development of character; that the real salvation of man is through work, self-respecting, self-sustaining toil and the opportunity to obtain happiness through intellectual and spiritual growth. Now let us return to the thread of our argument.

Inasmuch as over 80 per cent. of the youth leave the halls of learning so young, the conclusion is inevitable that the reason is because the education furnished, after that age, is not sufficiently in accord with the needs of the people. Either there is lack of appreciation of the value of additional academic education or else the mere cost of maintaining the child is too much of a burden on the family purse. Since by far the larger majority of the children are forced by circumstance or voluntarily leave school to earn a living, is it not self-evident that 80 per cent. of all public funds ex-

pended for public education above the grammar grade should be for vocational education? Not only so, but that such further public education should be for workers and home makers in the productive industries.

If you turn to the experience of the world you will find that the age of budding manhood has always been the age of apprenticeship. How can such a system of apprenticeship be established except by a close contact with the simplest forms of industrial life, developing each vocation as a natural sequence from the simple and fundamental to the complex and abstruse? In order to be explicit suppose we define the vocations as of two classes, the minor arts of expression or those which pertain to the care, development and maintenance of the body, and then the major arts of expression or those which pertain to the care, maintenance and development of the mind and the spirit. These two kinds of expression are so interlaced and interdependent that they can not be separated, and since also we are providing a university for a selected part of the eighty-odd per cent. of the youth of the land who now have no means of attaining a full development of their native ability we must consider the two as virtually one problem.

The first duty of such an educational system is to make each student self-supporting as soon as may be through the minor arts of expression or the care and development of the body. This must necessarily begin with tilling the soil and following the industrial trades that contribute to husbandry, which, of course, includes almost everything. This implies that the university and its subsidiary branches must be in control of a large quantity of land on which to demonstrate the application of all the arts and sciences to daily life. Not on the commercial basis

of making the student have the maximum of efficiency in the production of wealth for the sake of profit and gain alone, but also in all the major arts of expression which contribute to the intellectual and spiritual enjoyment of life—in plain words, to know how to live for the real things which make life worth while. To put it more bluntly, our present public school system will always fail of its final purpose unless it can develop the best there is in every one of our nation's children, and this can be done only by making it a possibility for any one, with the ability and the will, to make his own way through an industrial university established on the American ideal that every one should have a fair chance in the race of life—a chance to be self-supporting, self-reliant and have an all-round physical, moral, spiritual and industrial education up to the period of manhood, instead of being turned loose on the world while still children, as is now the custom.

Everything is ready for such a university. We have all the minor forms of the arts of expression already well established in state industrial schools, agricultural colleges and experiment stations. It is only necessary to establish at some central position, like the national capital, a great university with abundance of acreage to demonstrate the infinite possibilities of the minor arts and also the major arts of expression such as music, poetry, the drama, painting, sculpture and architecture, and devoted to the advancement of science. Our great new country with its marvelous natural, undeveloped resources has of course demanded the development of the people in the minor arts of expression first. After we have measured the greatness of a nation in its material resources and attainments, it remains to inquire what they have done in the realm of the major arts

of expression. It is only in the application and use of these major arts to the daily life of all the people that we can as a nation attain our inalienable rights to life, liberty and the pursuit of happiness—happiness that is spiritual and not merely physical. It is the lack of this intellectual and spiritual resource within ourselves that is the cause of so much discontent and misery among our people. Depriving the youth of the land of these higher things of life is robbing them of their birthright as citizens of this great republic. Therefore such a national university devoted to these higher aspirations of the soul is just as much a national need and a national duty as the primary school, and without which our educational pyramid has no apex.

Such a university in no way competes with or interferes with those state and denominational institutions which already exist, but by cooperating with them and supplementing the work they are doing it will bring all our educational forces into one harmonious whole and ever provide them leaders and teachers along new lines. By the establishment of local university centers wherever the present educational forces are inadequate for the needs of the people, it will be taking higher education to the people in a way that could never have been done before. We have at present an abundance of education for the rich and well-to-do; let us have in this new university an abundance of education for those who have to win their own way and are willing to give some share of their own services to the nation in part compensation for the advantages which the nation gives them through such an institution of learning. Let it be an institution where high pressure and haste are not the dominating influences, but one where thoroughness and devoted service may be an essential element. It is not necessary to force all wis-

dom through the human mind in a four years' course. Study and research should be the constant companion through life and a distinct gain will result in having one university wherein there is always contact with active production, and application of the arts and sciences to the life of the people. Another distinct gain will be in the holding in one institution the interlocking minor and major arts of expression just as they are in life, instead of having them separated as at present in various institutions. By this means we would teach that it is just as honorable to make a beautiful and useful basket or chair as to paint a picture or finance a railroad. The quality of excellence, honesty and utility applies to one as much as to another. We are not all qualified for the same work, and the influence of such a university would be to make it more easy for every one to find that occupation for which his natural gifts qualify him to attain success.

Our present scheme of education is to keep the student in an uncertain frame of mind as to his future work for as long a time as possible in the hope that the broad general education attained under such influence will enable him to choose a vocation more wisely. This may be true in a very, very, few instances but it usually has just the opposite effect of scattering the attention and inclinations while limiting at the same time the horizon line, on account of the very few professional courses provided. The policy of most universities seems to be to fence themselves in and make it ever more difficult for the student to enter on the plea that they are raising the standard of the scholarship. If a Phidias, a Raphael, a Mozart, a Galileo, a Shakespeare, a Tessler or a Hirschel, should ask admission to a modern university by reason of his ability, he would be examined in cube root, conic sections, ancient and modern history, and

required to analyze and parse Spencer's "Faerie Queene." The basis of examination is of analysis and criticism and not of construction and production. In all other things we are a practical people and our national university should broaden the lines of approach to higher education and make it possible to attain success in all the walks of life. Especially do we need an institution for constructive and vocational education in the major arts of expression. Only by a definite technical training in them from an early age, coupled with a broad general education, can we hope to attain great things in music, poetry, painting, sculpture and architecture.

The Department of Agriculture has had no great difficulty in building up a great system of scientific experiment and distribution of knowledge in everything which pertains to life on the farm, on the plea that all wealth comes from the soil, yet only one third of our population gain their living by tilling the soil. We ask of this new national university that it shall give an equal chance to the remaining two thirds of its citizens. We ask for the eighty-odd per cent. of our children the privilege of using the seven most important years of their childhood for their own development in an institution of learning where they may utilize their own earning capacities for their own growth.

This new university should recognize that every youth has the inalienable right to such instruction as will develop all the best there is in him, and this can be done best by making him self-supporting and self-reliant until he can take his place at maturity fully equipped for the battle of life. This is not to be attained by pampering and protection, but by tempered hardship and strenuous voluntary effort. Youth naturally seeks these environments and because our schools and colleges do not fur-

nish them for those who need them most, such an institution is not only an economic necessity but a moral necessity—if we are to rise to our national ideal that all men are created free and equal. Free to make the most of life and equal in the opportunities for self-development.

The government, early in its life, established schools for the Army and Navy on the necessity of national defence. Any national university must obviously give place to training for the civil service and the consular and the diplomatic service. For these reasons, if no other, the university and its subsidiary branches should give degrees or diplomas that will answer for civil service examinations in the many grades of this occupation. This kind of training is so varied and frequently so technical that no existing institution could be expected to do it for the government.

Of course, the great central university devoted to the highest kind of research in science, arts and letters, should reserve to itself the higher degrees, and that the attainment of such high degrees should be of such a kind as to have national and international importance.

Every great movement for the salvation of man from the sloth of degeneration has taken the form of exalting the people's ideals into a religion. Under such influence the world has tried salvation by faith, salvation by creed, salvation by vicarious atonement, salvation by law. Each age has also built great temples to their ideals to give definite form and power to their aspirations. If we are true to our national ideals of liberty we will build a temple to liberty in every county and city ward, where we may enthrone science and art and liberty for the salvation of mankind. During the centuries past the world has bowed before the privileges gained by force of arms, privileges granted by royal favor,

privileges gained by wealth. It remains for the American people to establish, by means of their ideals and temples to Liberty, the nobility of character as expressed by service to the welfare of all, through the realization of the brotherhood of man.

"I ask not wealth, but power to take  
And use the things I have aright,  
Not years, but wisdom, that shall make  
My life a profit and delight.

"I ask not that for me the plan  
Of good and ill be set aside,  
But that the common lot of man  
Be nobly borne and glorified."

H. K. BUSH-BROWN

#### *THE SCIENTIFIC STUDY OF THE COLLEGE STUDENT*<sup>1</sup>

It is worthy of note that, while the critics of the college have been able to adduce facts as the basis of their unfriendly opinions, the colleges have, for the most part, been unable to point to any considerable collection of accurate data regarding their own present effectiveness. It is, of course, quite true that the deductions drawn from their facts by these unfavorable critics are oftentimes manifestly more imposing than the factual structure can properly stand. It is also true that along certain detached and scattering lines this college or that has been able to point with pride to a small amount of accurate material more or less scientifically collected. Speaking broadly, however, the statement first made is true. It is perhaps to be acknowledged that the introduction of the larger use of facts into the measurement and development of college values will make education somewhat less interesting, for it will reduce the range of philosophical discussion and the application of personal opinion. Still, if the signs of the times are at all to be believed, the

day is fast approaching when the colleges and universities will be using facts and the scientific method as much in the direction of their educative processes, as a whole, as they already are using them in their laboratories and classrooms.

Secretary Furst, of the Carnegie Foundation, has said that there should be little talk of efficiency in college work until something has been done to make use of the enormous collection of data already possessed by the colleges of the country in the records of the hundreds of thousands of students who have passed through the four years of the campus and into the work of the world. Certainly there does exist a large body of facts worthy of study in connection with the administration of the present-day college. It seems to me rather doubtful, however, whether these facts are as likely to be given the attention they deserve as those collected according to some new method and with closer reference to the various problems to be solved in connection with the present and the future generations of students.

If this question is to be answered in the affirmative, it raises another. Shall the information for measuring the effectiveness of the college work with the present generation be attacked piece-meal—one problem one year, another the next, one phase in one college, another phase in another—or shall each college endeavor to conduct a study that shall be for it at once fundamental, broad, permanent and, in addition, as nearly scientific as the twentieth century permits?

A study possessing these dimensions has already been proposed by one of the greatest educators America has ever known. In 1899, President Harper, of Chicago University, recommended what he called the "scientific study of the student." Said that educational path-finder:

<sup>1</sup> Address before the Section of Education at the Cleveland meeting of the American Association for the Advancement of Science.